



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/455,991	12/06/1999	HISASHI OHTANI	07977/213002	5835

26171 7590 09/09/2003

FISH & RICHARDSON P.C.  
1425 K STREET, N.W.  
11TH FLOOR  
WASHINGTON, DC 20005-3500

EXAMINER

DIAZ, JOSE R

ART UNIT PAPER NUMBER

2815

DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/455,991

Applicant(s)

OHTANI ET AL.

Examiner

José R Díaz

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 6-12, 14-16, 18, 20, 21 and 23-71 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-12, 14-16, 18, 20, 21 and 23-71 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/998,964.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 23, 2003 has been entered.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

Art Unit: 2815

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

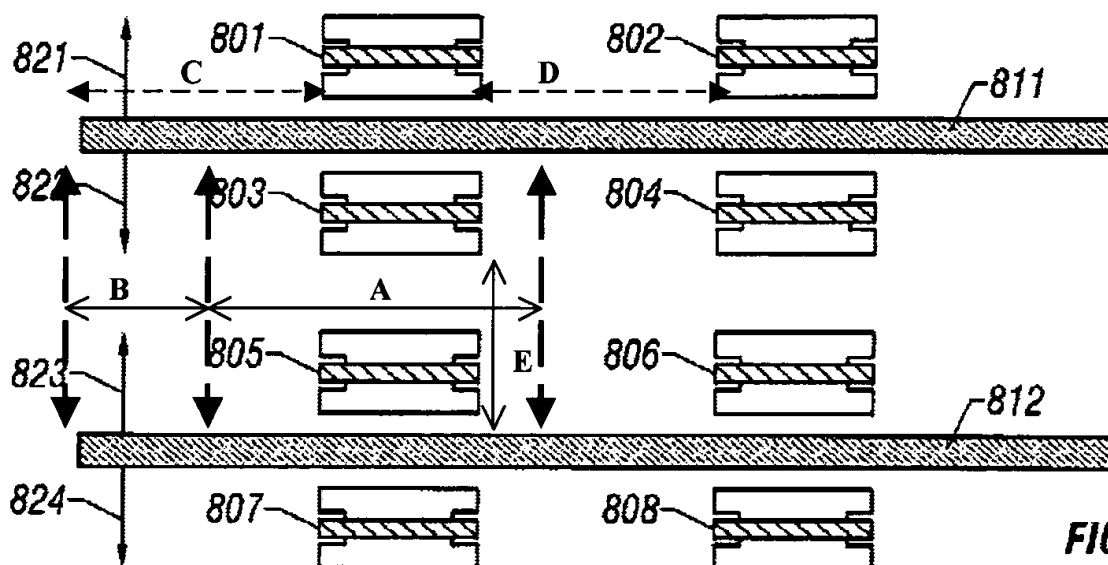
5. Claims 6-12, 14-16, 18, 20-21, and 23-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over (specifically "Description of the Related Art" on pages 1-4 of the specification) in view of Zhang et al. (US Pat. No. 5,529,937), previously cited on Paper No. 3.

Regarding claims 6, 9, 23, 31, 39, 55, and 63, Applicant acknowledges a well-known method comprising the steps of: forming an amorphous semiconductor film (see page 1, lines 24-26) on an substrate (see page 1, lines 11-13); providing a metal element (811, 812) capable of promoting crystallization of the amorphous semiconductor film to form a first metal element added region (811) and a second metal element added region (812) (see fig. 8, below); crystallizing the amorphous semiconductor film so that a crystal growth (822, 823) proceeds in a crystal growth direction parallel to the insulating surface to form first and second crystalline portion (see regions A and B between the metal element 811 and 812 in Fig. 8, below); patterning the crystalline semiconductor film to form at least one crystalline island or active region (803) using only the first crystalline portion (see region A between the metal element 811 and 812 in Fig. 8, below); wherein the first metal element added region (811) is away from the second metal element added region (812); wherein carrier move in the crystalline semiconductor island (803) in a carrier moving direction identical

Art Unit: 2815

with the crystal growth direction (822, 823) (see page 4, lines 9-11 and fig. 8, below); wherein the second metal element added region (812) is located apart from the crystalline semiconductor island (803) by a distance (E) (see Fig. 8, below); wherein the first metal element added region (811) has a length extending longer from an end portion of the crystalline semiconductor island (803) in a longitudinal direction of the first metal element added region (consider the portion of the metal element (811) that is between the end side of the region (B) and the end side of the crystalline semiconductor island (803) in Fig. 8, below).

However, applicant in the "Description of the Related Art" is silent with respect to the limitation of forming the amorphous semiconductor film on an insulating surface. Zhang et al. teaches that it is well known in the art to form an amorphous layer (104) over an insulating layer (102) (see fig. 1b). Applicant and Zhang et al. are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to form the amorphous layer over an insulating surface. The motivation for doing so, as is taught by Zhang et al., is to provide a protective film over the substrate (col. 8, lines 24-26). Therefore, it would have been obvious to combine applicant with Zhang et al. to obtain the invention of claims 6-12, 14-16, 18, 20-21, and 23-71.



**FIG. 8**  
**(Prior Art)**

Regarding claims 7, 32 and 56, Applicant acknowledges that the lengths (C, D) of the first metal element added region (811) and the second element added region (812) are set to 50% or more of a crystal growth distance (please note that the regions C and D has a length which is about twice the length of 801 or 803 region, see Fig. 8, above).

Regarding claims 8, 10, 25, 33, 41, 49, 57 and 65, Applicant acknowledges that the metal element comprises at least Ni (811, 812) (see page 3, line 21 of specification).

Regarding claims 11-12, 26-27, 34-35, 42-43, 50-51, 58-59 and 66-67, Zhang et al. teaches that it is well known in the art to introduced the metal element by an ion implantation or by coating a solvent (see col. 11, lines 21-35). The motivation for introducing the metal element by ion implantation or by coating a solvent is to introduce

Art Unit: 2815

a catalyst element, which promotes the crystallization of the amorphous layer (col. 5, lines 58-65).

Regarding claims 14, 18, 28, 36, 44, 52, 60 and 68, applicant acknowledges that the amorphous semiconductor film comprises silicon (see page 3, lines 22-24).

Regarding claims 24, 40, 47-48, 64, and 71, applicant and Zhang et al., as stated before, teaches the claimed method (see rejection of claim 6, above). In addition, applicant acknowledges that the lengths (C, D) of the first metal element added region (811) and the second element added region (812) are set to 50% or more of a crystal growth distance (please note that the regions C and D has a length which is about twice the length of 801 or 803 region, see Fig. 8, above). With regards to the claimed length of 100  $\mu\text{m}$  or more, it would have been obvious to one of ordinary skill in the art, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Huang*, 40 USPQ2d 1685,1688(Fed. Cir. 1996) citing *In re Aller*, 105 USPQ 233., 235 (CCPA 1955).

Regarding claims 15-16, 20-21, 29-30, 37-38, 45-46, 53-54, 61-62 and 69-70, Applicant acknowledges that at least one of the transistors (803) formed by the method disclosed in the *Description of the Related Art* "has characteristics suitable for high-speed operation" (see page 4, lines 9-11). With regards to the claimed S value, it would have been obvious to one of ordinary skill in the art, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum

Art Unit: 2815

or working ranges involves only routine skill in the art. *In re Huang*, 40 USPQ2d 1685,1688(Fed. Cir. 1996) citing *In re Aller*, 105 USPQ 233., 235 (CCPA 1955).

### ***Response to Arguments***


5. Applicant's arguments with respect to claims 6-12, 14-16, 18, 20-21, and 23-71 have been considered but are moot in view of the new ground(s) of rejection.

### ***Correspondence***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078. The examiner can normally be reached on 9:00-5:00 Monday, Tuesday, Thursday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
**GEORGE ECKERT**  
**PRIMARY EXAMINER**

JRD